PUBLIC LIBRARY,
DETROIT, MICH.
APR 24 1899

THE

AMERICAN JOURNAL OF SCIENCE.

EDITOR: EDWARD S. DANA.

ASSOCIATE EDITORS

PROFESSORS GEO. L. GOODALE, JOHN TROWBRIDGE, H. P. BOWDITCH AND W. G. FARLOW, OF CAMBRIDGE,

PROFESSORS O. C. MARSH, A. E. VERRILL AND H. S. WILLIAMS, OF NEW HAVEN,

PROFESSOR GEORGE F. BARKER, OF PHILADELPHIA,
PROFESSOR H. A. ROWLAND, OF BALTIMORE,
MR. J. S. DILLER, OF WASHINGTON.

FOURTH SERIES.

VOL. V—[WHOLE NUMBER, CLV.]

WITH V PLATES.

NEW HAVEN, CONNECTICUT.
1898.

R v.155-156 1898

THE TUTTLE, MOREHOUSE & TAYLOR PRESS.

NEW HAVEN, CONN.

CONTENTS TO VOLUME V.

Number 25.

Page

ART. I.—A new Harmonic Analyzer; by A. A. MICHELSON and S. W. STRATTON. (With Plate I.) 1

II.—A New Form of Physical Pendulum; by J. S. STEVENS 14

III.—The Protostegan Plastron; by G. R. WIELAND. (With Plate II.) 15

IV.—The Granitic Breccias of the Cripple Creek Region; by G. H. STONE 21

V.—Dispersion and Absorption of the Infra-Red Rays in Rock Salt and Sylvine; by H. RUBENS and A. TROWBRIDGE 33

VI.—Studies in the Cyperaceæ, VII; by T. HOLM 47

VII.—X-Rays and Mineral Phosphorescence; by J. E. BURBANK 53

VIII.—Phosphorescence produced by Electrification; by J. TROWBRIDGE and J. E. BURBANK 55

IX.—Electromotive Force; by J. TROWBRIDGE 57

X.—Surface Travel on Electrolytes; by W. E. FISKE and W. D. COLLINS 59

XI.—Iron Meteorites, as nodular structures in Stony Meteorites; by H. L. PRESTON 62

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics—Osmotic Pressure and Electrolytic Dissociation, COMPTON, 65.—Electrolytic Decomposition of Aqueous Solutions, NERNST, 66.—Direct production of Iron Carbide, MOISSAN, 67.—Production of Peroxides in Slow Oxidation, BACH, 68.—Constitution of Phosphorous acid, MICHAELIS and BECKER: Manufacture of Ammonium Cyanide, LANCE, 69.—Jahresbericht über die Fortschritte der Chemie und verwandter Theile anderer Wissenschaften: Change of alternating currents into direct, L. GRAETZ: Observation of air waves, R. EMDEN, 70.—Light, visible and invisible, S. P. THOMPSON: Bibliography of X-ray Literature and Research, 71.—Tafeln und Tabellen zur Darstellung der Ergebnisse Spectroskopischer und Spectrophotometrischer Beobachtungen. TH. W. ENGELMANN, 72.

Geology and Natural History—Paleozoic faunas of the Argentine, E. KAYSER, 72.—Volcanoes of North America, I. C. RUSSELL, 74.—British Museum Catalogue: Coral Boring at Funafuti, 75.—Origin of the Diamonds of South Africa, T. G. BONNEY, 76.—Les Diamants du Cap, L. DE LAUNAY, 77.—Building Materials of Pennsylvania, T. C. HOPKINS: Catalogue of Minerals, A. H. CHESTER: Synopsis Mineralogica, A. WEISBACH: Eighth Annual Report of the Missouri Botanical Garden, 78.—Catalogue Mammalium tam viventium quam fossilium, 79.

Miscellaneous Scientific Intelligence—Institute of France, Cuvier Prize: Mazama, A Record of Mountaineering in the Pacific Northwest: Kleinasiens Naturschätze, K. KANNENBERG, 79.—Applied Mechanics, J. PERRY: Fifty-second Annual Report of the Director of the Astronomical Observatory of Harvard College for the year ending September 30, 1897, E. C. PICKERING: Ostwald's Klassiker der exakten Wissenschaften, 80.

Obituary—Professor WINNECKE: Rev. SAMUEL HAUGHTON, D.D., 80.

Number 26.

Page

ART. XII.—27-Day Auroral Period and the Moon; by H. H. CLAYTON 81

XIII.—Combination Tones of the Siren and an Organ Pipe; by C. BARUS 88

XIV.—Some Products found in the Hearth of an Old Furnace upon the dismantling of the Trethellan Tin Works, Truro, Cornwall; by W. P. HEADDEN 93

XV.—Kant as a Natural Philosopher; by G. F. BECKER ... 97

XVI.—Islands and Coral Reefs of the Fiji Group; by A. AGASSIZ 113

XVII.—Simple Compensated Shunt Box; by W. M. STINE. 124

XVIII.—Mineralogical Notes on Cyanite, Zircon, and Anorthite from North Carolina; by J. H. PRATT 126

XIX.—Source of the X-Rays; by J. TROWBRIDGE and J. E. BURBANK 129

XX.—Four New Australian Meteorites; by H. A. WARD .. 135

XXI.—Measurement of Self-Inductance by Alternating Current and Electrodynamometer; by K. E. GUTHE 141

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics—Influence of Proximity on Voltaic Action, GORE: Action of Light on Chlorine and Hydrogen, GAUTIER and HÉLIER, 144.—Series Spectra of Oxygen, Sulphur and Selenium, RUNGE and PASCHEN, 145.—Production of Electricity by Chemical Means, ANDREAS: Graphite, Graphitite and Graphitoid, WEINSCHENK, 146.—Manuel d'Analyse Chimique appliquée à l'Examen des Produits Industriels et Commerciaux, É. FLEURENT: Organic Chemistry for the Laboratory, W. A. NOYES, 147.—Deductive Physics, F. J. ROGERS: Modes of Motion; or Mechanical Conceptions of Physical Phenomena, A. E. DOLBEAR: Electrical Wind, S. ARRHENIUS: Heat produced by the Röntgen rays, E. DORN, 148.—Effect of Cathode rays on air, P. LENARD: Electric arc between aluminum electrodes, V. v. LANG: Stratified discharges of electricity in free air, M. TOEPLER, 149.

Geology and Natural History—Geology of Johnson County, Iowa, S. CALVIN, 149.—Iowa Geological Survey; Annual Report, 1896, S. CALVIN: La face de la Terre (Das Antlitz der Erde), E. SUESS: Boletin del Instituto Geológico de México, J. G. AGUILERA, 152.—Zirkelite, M. E. WADSWORTH: Krystallographische Winkeltabellen, V. GOLDSCHMIDT, 153.—Tabellarische Uebersicht der Mineralien nach ihrer krystallographisch-chemischen Beziehungen geordnet, P. GROTH, 154.—Minéralogie de la France et de ses Colonies, A. LACROIX: Description of Minerals of Commercial Value, D. M. BARRINGER: Complete Catalogue of Minerals, W. M. FOOTE, 155.—Synoptical view of the various divisions of Embryophyta siphonogama; A. ENGLER, 156.

Miscellaneous Scientific Intelligence—Scientific Collections presented to Yale University, O C. MARSH, 156.—Smithsonian Institution, 1846–1896, 158.—Wiedemann's Annalen, Jubelband: Untersuchung über die Bahn des Cometen, 1822. IV, A. STICHENOTH: Problems of Nature, researches and discoveries of Gustav Jaeger, M.D., selected from his published writings: Verzeichness sämmtlicher Preparate, Drogen und Mineralien mit Erläuterungen, 1897, 160.

Obituary—DR. ALBRECHT SCHRAUF.

Number 27.

Page

ART. XXII.—Geothermal Data from Deep Artesian Wells in the Dakotas; by N. H. DARTON 161

XXIII.—Series of Transition Beds from the Comanche to the Dakota Cretaceous in Southwest Kansas; by C. N. Gould 169

XXIV.—Examination of some Triclinic Minerals by means of Etching Figures; by T. L. WALKER 176

XXV.—Some new Jurassic Vertebrates from Wyoming; by W. C. KNIGHT 186

XXVI.—Accessory Elements of Itacolumite, and the Secondary Enlargement of Tourmaline; by O. A. DERBY 187

XXVII.—Auriferous Conglomerate of the Transvaal; by G. F. BECKER 193

XXVIII.—Estimation of Manganese as the Sulphate and as the Oxide; by F. A. GOOCH and M. AUSTIN 209

XXIX.—Spectroscope without Prisms or Gratings; by A. A. MICHELSON 215

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics—Electrochemical method for changing an Alternating into a Direct Current, GRAETZ: Electrochemical Equivalent of Carbon, COEHN, 218.—Use of the Copper Voltameter, FOERSTER, 219.—Commencement of the Combination of Hydrogen with Oxygen, BERTHELOT: Different Varieties of Carbon (Amorphous, Graphite, Diamond), MOISSAN, 220.—Wissenschaftlichen Grundlagen der Analytischen Chemie, W. OSTWALD, 221.—Lehrbuch der Allgemeinen Chemie, W. OSTWALD: Inorganic Chemical Preparations, F. H. THORP: Experimental Physics, W. A. STONE: Physical Experiments, A. P. GAGE: Transmission of Radiant Heat by Gases at Varying Pressures, C. L. BRUSH, 222.—Conductivity of Carbon for Heat and Electricity, L. CELLIER: Determination of Relative Heat Conductivity by the Isothermal Method, W. VOIGT: Röntgen's Original Papers on the Röntgen Rays, RÖNTGEN, 223.—Johanniskäfer Light, H. MURUOKA: Occlusion of Hydrogen and Oxygen by Palladium, L. MOND, W. RAMSAY and J. SHIELDS, 224.—Refractivities of Air, Oxygen, Nitrogen, Argon, Hydrogen and Helium, RAMSAY and TRAVERS, 227.—Experiments with some Electrochemical Actinometers, RIGOLLOT, 228.

Geology and Natural History—Earth Movement, C. R. VAN HISE, 230.—Geology of Massanutten Mountain in Virginia, A. C. SPENCER, 231.—Geological Survey of Canada, G. M. DAWSON: Geological sections from Moscow to Siberia and return, P. FRAZER: Note on the "Florencia Formation," H. A. PILSBRY, 232.—Geology of Franz Joseph Land, 233.—Remarkable occurrence of xenotime, G. C. HOFFMANN: Crystalline Structure of Gold and Platinum Nuggets and Gold Ingots, 235.—Flora of Franz Josef Archipelago, H. FISHER, 236.

Miscellaneous Scientific Intelligence—International Congress of Zoology, 1898, 238.—Report of S. P. Langley, Secretary of the Smithsonian Institution, for the year ending June 30, 1897, 239.—Studies from the Yale Psychological Laboratory: The Sylvester Medal: Floods of the Mississippi River, 240.

Number 28.

Page

ART. XXX.—The Bolometer; by S. P. LANGLEY 241

XXXI.—Temperature Coefficients of Certain Seasoned Hard Steel Magnets; by A. DURWARD 245

XXXII.—Skull of Amphictis; by E. S. RIGGS 257

XXXIII.—Condition of Oxidation of Manganese precipitated by the Chlorate Process; by F. A. GOOCH and M. AUSTIN 260

XXXIV.—San Angelo Meteorite; by H. L. PRESTON 269

XXXV.—Pre-Glacial Decay of Rocks in Eastern Canada; by R. CHALMERS 273

XXXVI.—New Form of Make and Break; by C. T. KNIPP 283

XXXVII.—Datolite from Guanajuato; by O. C. FARRINGTON 285

XXXIX.—Clinohedrite, a new mineral from Franklin, N. J.; by S. L. PENFIELD and H. W. FOOTE 289

XL.—Rhodolite, a new variety of garnet; by W. E. HIDDEN and J. H. PRATT 294

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics—Solubilities of Liquids, AIGNAN and DUGAS: Thermodynamics of the Swelling of Starch and the Determination thereby of its Molecular Mass, RODEWALD, 297.—Evolution of Oxygen during Reduction, FRENZEL, FRITZ and VICTOR MEYER, 298.—Chromium Tetroxide and Perchromates, WIEDE: Potassium Percarbonate, VON HANSEN, 299.—Formation of Natural Petroleum and the Spontaneous Polymerization of Hydrocarbons, ENGLER: Sun's Place in Nature, SIR N. LOCKYER, 300.—Nature of Röntgen Rays, STOKES: Impulse theory of X-rays, J. J. THOMSON, 301.—Acoustic phenomena in the Electric Arc, SIMON: Time of vibration of very high notes: Electrical excitation: Manual of Experiments in Physics: Laboratory Instruction for college classes, J. S. AMES and W. J. A. BLISS, 302.

Geology and Mineralogy—Recent Publications of the U. S. Geological Survey, 303.—Gold Fields of Alaska, 305.—Geological nomenclature, 313.—Development of Glyphioceras and the Phylogeny of the Glyphioceratidæ, J. P. SMITH: Brief notices of some recently described minerals, 315.—Handbuch der Mineralogie, Dr. C. HINTZE: Ueber Alter, Lagerungsform und Entstehungsart der Periadriatischen granitkörnigen Massen, Dr. W. SALOMON, 316.—Petrology for Students, an introduction to the study of rocks under the microscope, A. HARKER, 317.

Botany and Zoology—Pflanzenphysiologie; Handbuch der Lehre vom Stoffwechsel und Kraftwechsel in der Planze, Dr. W. PFEFFER, 317.—Permeability of the bark of tree-trunks to atmospheric gases, H. DEVAUX: Lessons with Plants; Suggestions for Seeing and Interpreting some of the Common Forms of Vegetation, L. H. BAILEY, 318.—Catalogue of the Madreporarian Corals in the British Museum, H. M. BERNARD: Text-book of Zoology, T. J. PARKER and W. A. HASWELL, 319.

Miscellaneous Scientific Intelligence—United States Coast and Geodetic Survey: Annals of the Astronomical Observatory of Harvard College, 320.—L. Rütimeyer-gesammelte kleine Schriften allgemeinen Inhalts aus dem Gebiete der Naturwissenschaft nebst einer autobiographischen Skizze, H. G. STEHLIN: Transactions of the American Microscopical Society: Physikalisch-chemische Propädeutik, H. GRIESBACH, 321.—Bibliography of the Metals of the Platinum Group, J. L. HOWE, 322.

Obituary—WILLIAM A. ROGERS, 322.

Number 29.

Page

ART. XLI.—Some Conditions affecting Geyser Eruption; by T. A. JAGGAR, JR. 323

XLII.—Properties of Seasoned Magnets made of Self-Hardening Steel; by B. O. PEIRCE 334

XLIII.—Curious Inversion in the Wave Mechanism of the Electromagnetic Theory of Light; by C. BARUS 343

XLIV.—Determination of Plagioclase Feldspars in Rock Sections; by G. F. BECKER. (With Plate III.) 349

XLV.—Some Lava Flows of the Western Slope of the Sierra Nevada, California; by F. L. RANSOME 355

XLVI.—Krennerite, from Cripple Creek, Colorado; by A. H. CHESTER 375

XLVII.—Some new Jurassic Vertebrates from Wyoming; by W. C. KNIGHT 378

XLVIII.—Estimation of Manganese separated as the Carbonate; by M. AUSTIN 382

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics—New Methods for Measuring Gases, BLEIER, 385.—Influence of the Röntgen Radiation on the Velocity and Rate of Recombination of the Ions of Gases, 386.—Connection between Fluorescence and Chemical Composition, R. E. MEYER: New method of preparing pure Iodine, LEAN and WHATMOUGH, 387.—Borides of Calcium, Barium and Strontium, MOISSAN and WILLIAMS: Arrangement of Atoms in Space, VAN'T HOFF, 388.—College Course of Laboratory Experiments in General Physics, S. W. STRATTON and R. H. MILLIKAN, 389.—Text-book of Physical Chemistry, C. L. SPEYERS: Tutorial Chemistry, G. H. BAILEY, 390.—The ultra-red spectrum, H. RUBENS and E. ASCHKINASS: Transparency of fluids for heat rays of great wave-length, H. RUBENS and E. ASCHKINASS: Electrical resistance standards, W. JAEGER and K. KAHLE: Electric equilibrium between uranium and an insulated metal in its neighborhood, KELVIN, 391.

Geology and Mineralogy—L'échelle réduite des expériences géologiques permet-elle leur application aux phénomènes de la nature? W. PRINZ, 392.—Geological survey of the Witwatersrand, Southern Transvaal, F. H. HATCH: Revised Text-Book of Geology by James D. Dana, edited by WM. N. RICE: Genus Lepidophloios, J. W. DAWSON, 393 —Geological Survey of Georgia: Geological Survey of India, 394.

Miscellaneous Scientific Intelligence—Report of the National Academy of Sciences for the year 1897, 395.—National Academy of Sciences, 396.—American Association for the Advancement of Science, 397.—Science Abstracts, 398.

Obituary—PROF. JULES MARCOU.

Number 30.

Page

ART. XLIX.—Theory to Explain the Stratification of the Electric Discharge in Geissler Tubes; by H. V. GILL. (With Plates IV, V.) 399

L.—Orthoclase as gangue mineral in a fissure vein; by W. LINDGREN 418

LI.—Notes on Rocks and Minerals from California; by H. W. TURNER 421

LII.—Mineralogical Notes on Anthophyllite, Enstatite and Beryl (Emerald) from North Carolina; by J. H. PRATT 429

LIII.—Bethany Limestone at Bethany, Missouri; by H. F. BAIN 433

LIV.—Psychrometer applicable to the Study of Transpiration; by R. G. LEAVITT 440

LV.—Action of Carbon Dioxide on Soluble Borates; by L. C. JONES 442

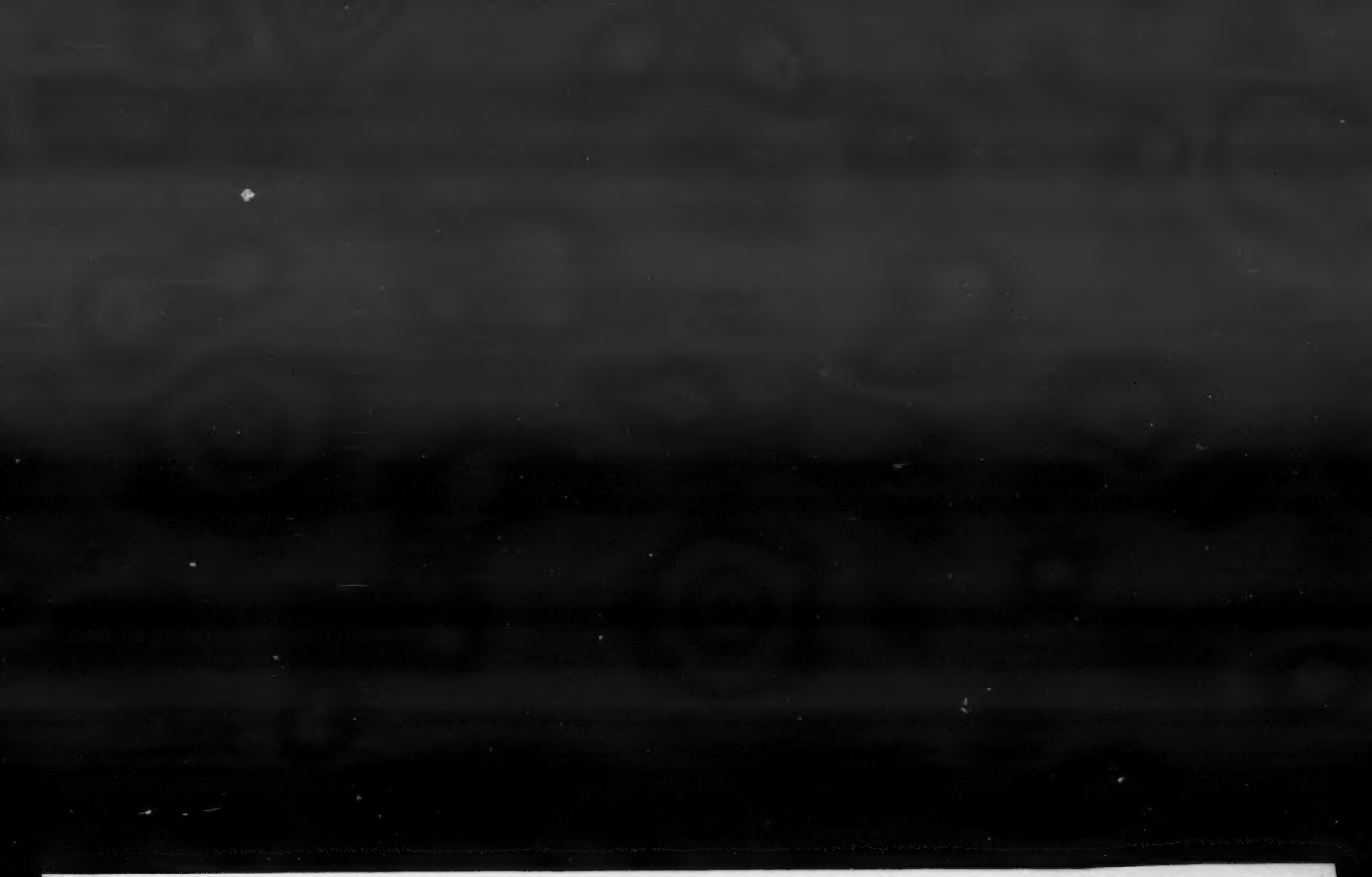
LVI.—Jerome (Kansas) Meteorite; by H. S. WASHINGTON. 447

LVII.—Comments on Bulletin 21. "Solar and Terrestrial Magnetism in their relations to Meteorology;" by F. H. BIGELOW 455

SCIENTIFIC INTELLIGENCE.

Chemistry and Physics—Electrolytic Dissociation and Osmotic Pressure, TRAUBE: New Substance for increasing the Angle of Rotation, WALDEN, 463.—Influence of the Silent Discharge on Atmospheric Air, SHENSTONE and EVANS, 464.—Action of Hydrogen on Sulphuric Acid, BERTHELOT: Preparation of dry Hydrogen cyanide and Carbon monoxide, WADE and PANTING, 465.—Electrolytic production of Iodoform, FOERSTER and MEVES: Physikalisch-chemische Institut der Universität Leipzig: Manual of Quantitative Chemical Analysis, 466.—Fluorescence and Actinic Electricity, G. C. SCHMIDT: New Method of determining the inclination and horizontal intensity of the earth's magnetism, G. MEYER: Röntgen Rays and ordinary light, LORD RAYLEIGH, 467.—Method of Measuring the Pressure at any Point on a Structure, due to wind blowing against that Structure, F. E. NIPHER, 468.

Geology and Mineralogy—Geological Survey of New Jersey: Physical Geography of New Jersey, R. D. SALISBURY and C. C. VERMEULE, 468.—Cretaceous of Athabasca River, J. B. TYRRELL: Mineral Resources of the U. S. for 1896, D. T. DAY: Artificial Production of Diamond in Silicates corresponding to the Actual Mode of Occurrence in South Africa, I. FRIEDLÄNDER, 469.—Contribution to the Petrography of the Boston Basin, T. G. WHITE, 470.

Botany—Structure of the cell-wall, W. GARDINER, 470.—Phytogeography of Nebraska, R. POUND and F. E. CLEMENTS: Text-book of Botany, STRASBURGER, SCHIMPER, NOLL and SCHENCK, 471.—Fossil Plants, for students of Botany and Geology, A. C. SEWARD: Contributions to Japanese Characeæ, T. F. ALLEN, 472.

INDEX TO VOLUME V, 473.